ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
ER REGULATORY CONTACT RECORD

Date/Time:	September 12, 2005			
Site Contact(s):	Annette Primrose, Karen Wiemelt, Norma Castaneda, Bob Fiehweg,			
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Agency:	EPA	CDPHE	CDPHE	

Purpose of Contact: Use of phytoremediation technologies to further reduce impacts to groundwater in the Solar Evaporation Ponds and East Trenches Areas

Discussion

As described in the Interim Measure/Interim Remedial Action for Groundwater at Rocky Flats Environmental Technology Site (GW IM/IRA)(DOE, 2005), implementation of phytoremediation technologies in the steep and unstable, narrow areas downgradient of the Solar Ponds Plume and East Trenches Plume groundwater treatment systems took place in Spring 2005. The timing of the planting was critical. According to the CDOT specifications, plant cuttings had to be collected in early spring to ensure that the plant materials had sufficient energy reserves and had not yet started budding. Therefore, approval to commence planting was received from the Agencies via contact record prior to final approval of the GW IM/IRA.

Planting began in early May and was completed within a week. Weather conditions at this time were warm and facilitated field work. Following the planting, a period of rain and cool weather helped the cuttings establish. Final application of a soil enhancement products was made in late May, completing the project. By the middle of June, most of the cuttings had signs of growth and vitality. The cuttings continued to establish over the summer. Survival of the cuttings and any required maintenance will be evaluated in September.

The materials used in this project and the methods of installation are described below.

Installation information: The first site planted was the Solar Ponds Plume area (Solar Ponds Plume figure attached). An area of approximately 1 acre was planted. A total of 770 plants were installed, 335 cottonwoods and 435 willows. All of the cuttings were soaked in root dip product and inserted into a 12 to 18 inch hole punched into the earth with a long, pointed steel piercing implement. The planting hole was sealed by a footstep or another plunge with the implement to ensure proper planting.

The second site was the East Trenches Plume area along Ponds B-1, B-2 and B-3 in the South Walnut Creek drainage (East Trenches Plume figure attached). This site has three separate planting areas, each less than a half acre. Planting techniques were the same, however, in this area, some plantings were doubled up in their planting holes to ensure at least survival of at least one cutting and to gain extensive localized growth. The planting area along the B-ponds was steeply sloped and has a very short transition zone from wetter soils at the pond edges to the dry soils supporting cactus growth immediately upgradient. As a result, the planting strategy was to install the cuttings closer together in wet areas, and space them farther apart in dry areas. A total of 760 plants were installed as follows: Pond B1 and B2 area was planted with 317 cottonwoods

and 158 willows for a total of 475 plants. Pond B3 was planted with 170 cottonwoods and 115 willows for a total of 285 plants.

After project completion, the exact locations for the plantings were determined by survey and are identified on the attached figures.

Plant Materials: CDOT Specifications for collection and planting willow and cottonwood cuttings were followed (18"-24" long, ¾"-1.5" diameter, collected when willows are dormant, after Nov. 1st and before April 1st to protect nesting birds, cut at a 45 degree angle on the bottom, with approximately 12"-18" below the ground and 6" above the ground). The plant material included collections of local native cottonwood (*Populus* sp.) poles (also known as whips) and willow (*Salix* sp.) cuttings from Jefferson County and Boulder County locations.

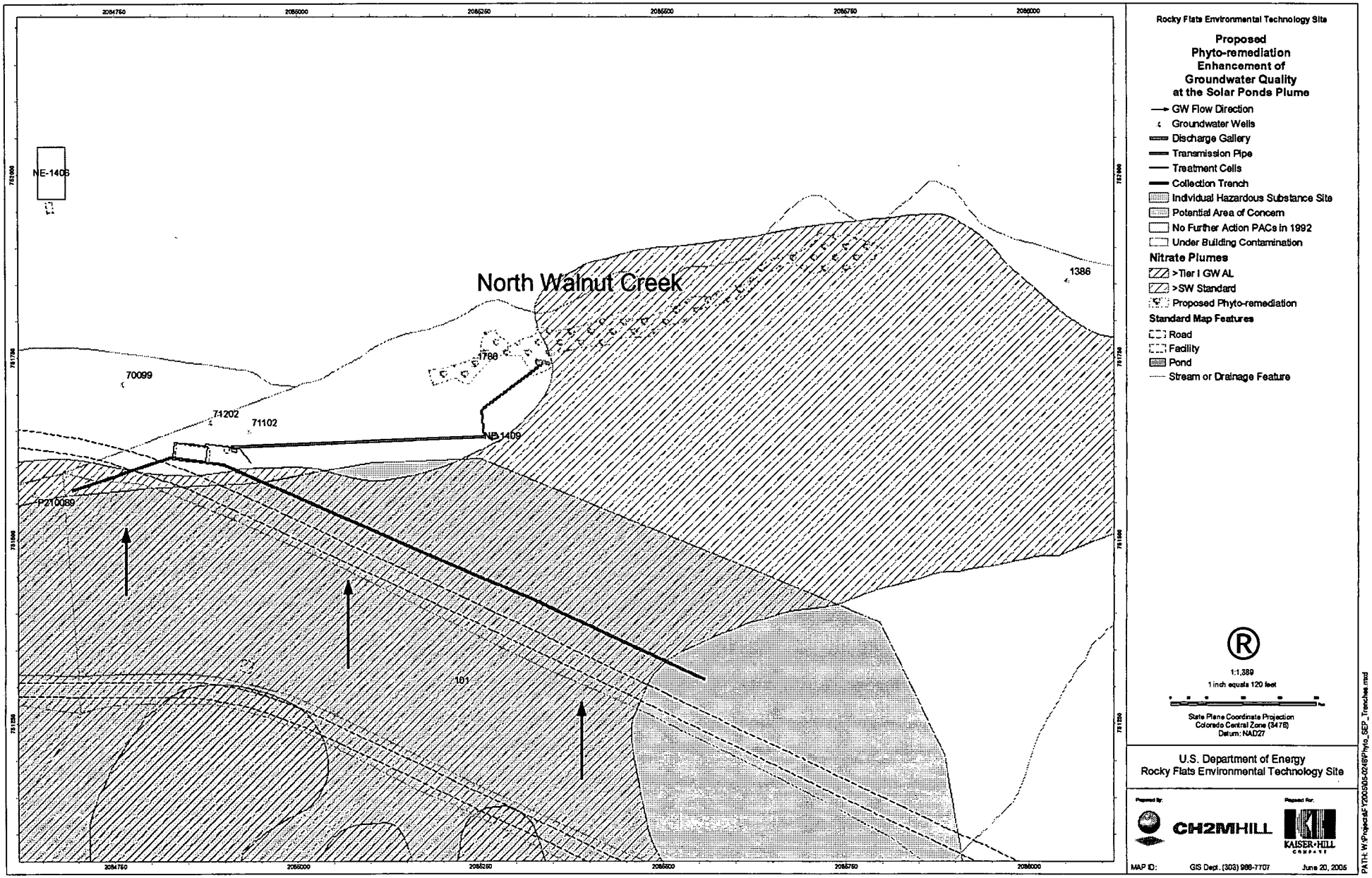
Root Stimulants and Soil Enhancements: To ensure for the rapid development of the roots and rhizosphere, biological soil inoculants and soil conditioners were used. The products included a root dip product and a soil-conditioning product described below:

DIEHARD Root Dip - The root dip product is formulated as a bare root mycorrhizal inoculant treatment with live beneficial mycorrhizal fungi to inoculate the newly forming roots of the cuttings. All of the cuttings were soaked in the root dip prior to planting. The mycorrhizal inoculants are combined with humic acids, biostimulants, beneficial bacteria, soluble sea kelp, and yucca plant extracts, to promote rapid root development. The product also contains a polyacrylamide water management gel that keeps a small amount of water in the root zone to keep roots from drying out.

Humega - This soil-conditioning product is certified organic product composed of rich organic material and humic acid substances that condition the soil and help build soil structure. This produce was added after planting as a liquid that was drenched into and around the soil at each planting. This product promotes soil aeration and water penetration by encouraging the flocculation of soil particles. It also aids in uptake and availability of micronutrients and buffers salts in the soil. The product also contains enzymes that increase the rate of nutrient absorption. Nutrients and nitrogen are stabilized in the rhizosphere where they remain available as food stores for the soil organisms and the plants.

Contact Record Prepared By: Annette Primrose

Required Distribution:		Additional Distribution:
M. Aguilar, USEPA	D. Kruchek, CDPHE	C. Dayton, K-H ESS
H. Ainscough, CDPHE	S. Nesta, K-H RISS	I. Paton, K-H ESS
J. Berardini, K-H	A. Primrose, K-H RISS	A. Thornburg, USFWS
B. Birk, DOE-RFPO	M. Roy, DOE-RFPO	M. Sattelberg, USFWS
L. Brooks, K-H ESS	R. Schassburger, DOE-RFPO	C. Franklin, DOE
G. Carnival, K-H RISS	S. Serreze, K-H RISS	B. Fiehweg, K-H RISS
N. Castaneda, DOE-RFPO	D. Shelton, K-H ESS	_____
C. Deck, K-H Legal	C. Spreng, CDPHE	_____
N. Demos, SSOC	S. Surovchak, DOE-RFPO	_____
S. Garcia, USEPA	J. Walstrom, K-H RISS	_____
S. Johnson, K-H ESS	K. Wiemelt, K-H RISS	_____
M. Keating, K-H RISS	C. Zahm, K-H Legal	_____
L. Kimmel, USEPA		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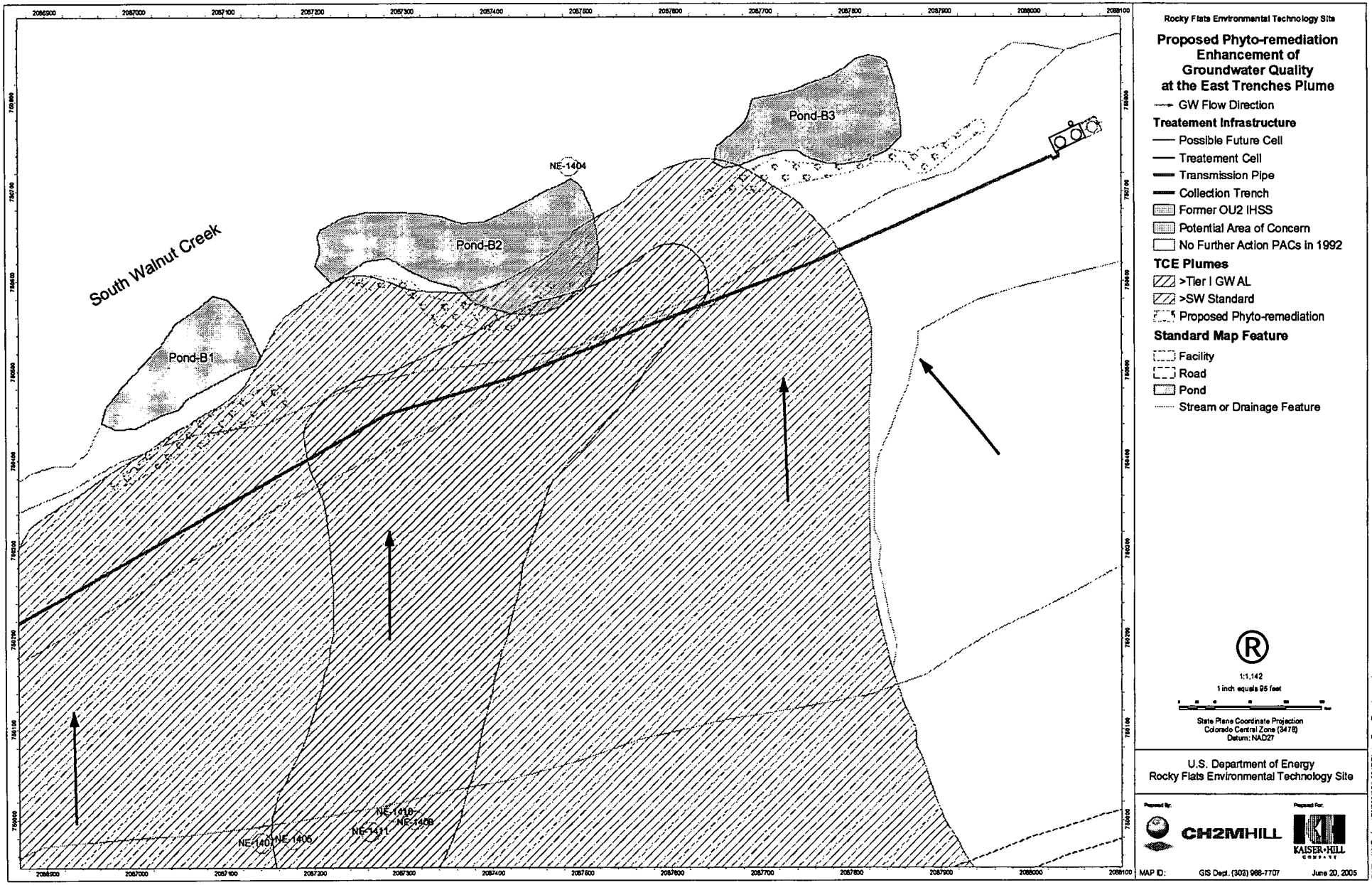
2085250
2085500
2085750
2086000
NE-1405
North Walnut Creek
1386
780
70099
71202
71102
NE-1409
P210089
101
Rocky Flats Environmental Technology Site
Proposed
Phyto-remediation
Enhancement of
Groundwater Quality
at the Solar Ponds Plume
GW Flow Direction
Groundwater Wells
Discharge Gallery
Transmission Pipe
Treatment Cells
Collection Trench
Individual Hazardous Substance Site
Potential Area of Concern
No Further Action PACs in 1992
Under Building Contamination
Nitrate Plumes
>Tier I GW AL
>SW Standard
Proposed Phyto-remediation
Standard Map Features
Road
Facility
Pond
Stream or Drainage Feature
1:1,389
1 inch equals 120 feet
State Plane Coordinate Projection
Colorado Central Zone (3476)
Datum: NAD27
U.S. Department of Energy
Rocky Flats Environmental Technology Site
Prepared By:
CH2MHILL
Prepared For:
KAISER-HILL COMPANY
MAP ID:
GIS Dept. (303) 966-7707
June 20, 2005
PATH: W:\Projects\720505\05-0249\Phyto_SEP_Trenches.mxd


Pond-B3
NE-1404
Pond-B2
South Walnut Creek
Pond-B1
NE-1410
NE-1408
NE-1411
NE-1407
NE-1405
Rocky Flats Environmental Technology Site
Proposed Phyto-remediation Enhancement of Groundwater Quality at the East Trenches Plume
GW Flow Direction
Treatement Infrastructure
Possible Future Cell
Treatement Cell
Transmission Pipe
Collection Trench
Former OU2 IHSS
Potential Area of Concern
No Further Action PACs in 1992
TCE Plumes
>Tier I GW AL
>SW Standard
Proposed Phyto-remediation
Standard Map Feature
Facility
Road
Pond
Stream or Drainage Feature
1:1,142
1 inch equals 95 feet
State Plane Coordinate Projection
Colorado Central Zone (3478)
Datum: NAD27
U.S. Department of Energy
Rocky Flats Environmental Technology Site
CH2MHILL
KAISER-HILL COMPANY
MAP ID:
GIS Dept. (303) 966-7707
June 20, 2005
PATH: W:\Projects\FY2005\05-0248\Phyto_East_Trenches.mxd